

CHRYSPIS

TO

QUERELA,

A

LETTER publish'd

By a

Friend of CHRYSPIS.

Thomas White.

Amicus certus in re incertâ cernitur.

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THIS then must be the *Mode*; two to two; the Authors, and the Publishers; or rather we, I mean my fellow-Publisher and I, are onely as *Lay-Brothers* to the *Principal Disputants Chrysostomus and Quercela*; and therefore no more can reasonably be expected of us, then to present their Papers, stand by, and look on; or at most, if occasion should afterwards require it, bear witness how they carried themselves: Nor let our lower condition discourage us; we may be honest as well as they; nay, perhaps with far more ease and security; their wisdoms still tempting them to be *Politicians*, while our unskilfulness inclines us to plain dealing; a *Quality*, which my reason as well as interest, engages me to esteem, above all the devices of the finest and craftyest wits.

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First then I freely and openly acknowledge my self One, far highly oblig'd to Chrysalpis, (under another more fortunate Name) then to all the World besides, having continually receiv'd from Him so many and so happy satisfactions in the noblest and most important Inquisitions of a Rational Soul; yet seriously profess, I am not conscious of ever following him one hairs breadth farther then his Reason drew me; and this, not onely by the humour of my nature (whether stubborn or ingenuous, I know not) that secures me from such a servile spirit; but by his expresse and constant direction, never to depend the least jot on him, but entirely on the pure force of Truth and Evidence: a Lesson I hope the Reader shall see I perfectly observe in my frank relation of this Encounter; wherein, (if I may judge) they Both gave too much advantage to one another: for Chrysalpis's foot, which us'd to stand firm and strong, unhappily slipt; and Querela, instead of dispatching him, made at him with such a bungling blow, that himself lay open to an easy revenge.

But, to disguise the story no longer in a Metaphor, Master White having written many excellent Pieces, both in Philosophy and Divinity, and endeavour'd (not with-

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out a good degree of Success) to reduce those noblest Sciences to a fair correspondence and orderly connexion, undertook to print a little Treatise in Geometry, hoping it might invite some apt to be affected with such motives, to read his other works, not that they needed it, but we; nor is he so severely to be interpreted that the fate of all his Books should depend on this (God forbid so rich a treasure should be so rashly ventur'd) but conceiving he had found the Quadrature, he consequently argues; He has invented in Mathematicks what was thought impossible, therefore his other speculations are not to be neglected: which you would pervert to a quite contrary sense; He has miscarry'd in what was thought impossible, therefore he is deceiv'd in every thing else; which consequence if we admit, we are weak discour-sers; if we deny, 'tis a weak Discourse, having not the least reason to sustain it. 'Tis true, this his expectation met with the mischance of failing; but why should he not be allow'd the benefit of repenting? since, as soon as he saw his error, no lesse friendly then clearly discover'd to him by the Learned and rightly Honourable Lord, my Lord Brouncker, he immediately retracted it, both by Word, in his thankful Letters to his Lord-

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ship; and by deed, in his quick suppressing the Book when 'twas ready to be publish'd, and what in so short a time could he have done more? who knows how long Guldinus liv'd in a confidence of his error, before he retracted it? who knows not how tenaciously all those famous Mathematicians that conceited they had found this Quadrature, cleav'd to their opinions? read but Guldinus himself, lib. 2. pro. 4. and you shall see how many he there brings in more glorying in the Invention, more obstinate in defending it, more dilatory in revoking it, then the so clamorously condemn'd Chrylaspis; yet every one mistaken as well as he: All-I can say, is, 'tis the fate (alas!) of Circle-squares, and Philosopher-stone finders, to boast and to miscarry.

Instantly after this calling in Chrylaspis, out comes Querela, not onely disingenuous enough to betray to the World the secret defects of Chrylaspis, after knowledg of its being recal'd; but bold enough to confess in print that knowledg; nay worse, envious enough to do all this in plain English, and a stile flat and mean, fit for the lowest capacity of the vulgar. Certainly, a proceeding neither just nor civil; not to talk of courteous or charitable. But, Chrylaspis had wrong'd

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a friend of Querela's : and I willingly commend his undertaking to defend him, as one of the worthiest and most generous actions that belong to our nature; yet with this Caution, he must take heed of injuring Reason, while he strives to do right to Friendship. Let's then examine the Cause.

Querela complains that Chrysaëpis had stoln a thing call'd (for really it was not) a Demonstration: the Accus'd answers the Charge, and gives his reasons to clear himself. But, that they contend about being a plain error, in a Science where fallacies get neither credit nor profit, I can believe Chrysaëpis may possibly fall into the same mistake with Guldinus (that was the friend's Name) but scarce can imagin he should steal from him a deaf nut, or a rotten apple: and therefore, since 'tis at least probable, the Casuist that allows so deep a revenge for taking away an Apple, meant a sound one, which no ways hinders my pretence; I desire this Case may be dismiss'd for its under-value. You strive indeed to enhance the Crime, because 'twas Guldinus's proper Invention, of which Chrysaëpis rob'd him; and every one is apt to cherish, and tenderly love the issue of their own brain: But, what if it was no more then one of Guldinus's by-blows? what

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if not so much, but a meer abortion? and therefore I desire again, it may be dismiss; for an error ought never to be made much of, Whoever is the father.

If it be said Chrysalpis suddenly took what he thought was sound; That would acquit him absolutely of even the least suspicion to be conscious of Guldinus's Retraction, which is a greater Crime, and more severely imputed. Yet, that 'twas possible he might not know it, will easily be believ'd by any who know him; a Person soon weary of reading flourishes, and fine words, if they deliver but ordinary sense; and such perhaps he judg'd Guldinus's, and I doubt he might have some temptation to do so, if he did not light on very favourable passages; if he read his Dedicatory, his Transitory, his Discursive parts even among his Demonstrations, strangely too talkative for a Mathematician. And though we agree Guldinus have truly acknowledg'd his error, yet not so openly, that he that runs may read it; he confesses publicly, but 'tis in the corner of the Church: No Title of any the five Propositions, (lib. 2. c. 3.) where he treats directly of it, expressing any mistake; but proposing still either to examin something about the Question; or, to try how the Principle he had

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rely'd on, subsisted, &c. not, where it fail'd: so that his Retraction indeed, is there in print, yet so nicely touch'd, and in so few words, and those mingled and almost lost among many others, that easily it might escape a less diligent Reader. Not that I mean, in this, entirely to justify Chrysalpis, but rightly to state his fault; which is, that as it was free for him at first, to think the Book not worth his study, yet ought he not censure it without a full perusal.

But, if Chrysalpis judg'd too hastily; is that a crime beyond all pardon? are we not every one of us sometimes overseen? He that's innocent, let him throw the first stone; I'm sure he that threw the first stone at Chrysalpis is not innocent: for had he with impartial industry read over Guldinus, he might easily have found very many periods not so uncensurable as he imagins. He complains that Guldinus is accus'd, and calls it unworthy, injurious, &c. and cites places out of his Book to acquit him. I ask, may not a Writer be modest, humble, and solid, in some parts of his Book, and quite contrary in others? if I unhappily light upon these, am I not excusable, in saying I dislike them? if your better fortune lead you to those, may you not commend as you see cause? Querela
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may exalt Guldinus, Chrysaspis may depress him, both may have reason: and, in my conceit, all this is not onely possible, but true: for I see sometimes he discourses ingeniously and modestly; sometimes again trivially and vainly: This branch I must prove; the other Querela will freely grant; and two or three Instances I hope will dispatch it. Onely here I desire to enter this Protestation, that I am really sorry the just defence of my best Friend, engages me to look into the faults of others, wherein I thank God, I take no delight.

To begin with a short account of the Book in generall, whereof first, I find a great part very little akin to the Title: and of that little, very much mechanically not Geometrically treated: and this, Guldinus freely acknowledges, and seems indeed by many passages of his Book, to be a good natur'd man: He gathers out of others, most of his notions; of whose names he gives his Reader two fair Catalogues: in one of which, there are not many above thirty; but, in the other, almost fourscore. He professes most to meddle with the practical part, but tells you where to find the Demonstrations. His Collections are often not pertinent to his end, but are many times, for all that, pretty things in themselves.

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selfes. The subjects he treats of are, some of them indeed hardly reducible to his purpose, as Algebra, numbers, ranging of Troops; besides, long Tables, &c. Yet are they all fit for Youth to learn, and that was the design of these his Labours, (as himself professes in his Preface to his third Book,) though afterwards collected & printed in Folio: And will you now wonder, that one who us'd stil to be the best man in the Company he taught and daily triumpht among his Scholars, should be tainted at last with a little Vanity? for my part, I think it so shewd a temptation, that few in such circumstances are observed to resist it.

But to come to the particulars: this spirit of Vanity may be plainly seen walking up and down his Book; I'm sure I met it often, especially in his Epistles and Discourses which generally tast a little strong of the School-master. Turn but to the page 67. and read Ultimū ergo mirabilis illius lineæ punctum in quo nimirum vis omnis omneque momentum ac pondus circa Quadraturam Circuli consistit, quodque neque antiqui neque moderni, (interque illos nec nos ipsi) omnino geometrice determinant; ipsum tamen Centrum esse Gravitatis semiperipheriæ circuli nos primum mundo manifesta-

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mus. Wherefore, of that wonderful line, the last Point, in which all the force and all the moment and weight, in relation to the Quadrature of the Circle, consists; and which neither the Ancients nor the Moderns (*nor among them we our selves*) do altogether Geometrically determin; yet that it is the Center of Gravity of the Circles semicircumference, *We first manifest to the World.*

Will one more content you? See then the first Chapter of his third Book; where having briefly mention'd what the Ancients and Moderns had taught for measuring of round surfaces, and administering their Methods, begins thus of his own: Nos eam ita tractare constituimus, ut eandem ex solis & unicis nostris principiis, &c. pendere ostendamus — Quare etiamsi nullius alterius Geometrae exstarent de Dimensione Rotundi lucubrationes, eam tamen ex his nostris sine ullo alio alterius auxilio expediemus. This is your modest man: does he not deserve to be enthron'd on a golden Chariot, and great Archimedes with him, and so both be led into the Capitol of eternal Honour? What else do his own Words mean in his long Preface to the fourth Book? — Quem (Archimedem) aureo nobiscum se-

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sedentem curru in honoris perpetui arcem
Capitolinam deducemus.

Run now over the rest of this great Volume, and when you have wondred as you go at the vast variety of forreign subjects he has gathered together, pass on to the very end where you shall find a long and pleasant exercise, which will both need, and perhaps by its jolly humour, deserve your Courtesie to forgive a little tediousness. The mirth, I confess, came with some disadvantage to me, because I had formerly seen the substance of it elsewhere, though not so illustriously manag'd as by this Authour. 'Tis a curious Arithmetical Problem, and begins pag. 351. Where after a short Rhetorical Introduction, he entertains his Reader with some pretty little flourish, to usher in the grand VVork. First he proposes the Case of 100 stones so dispos'd at several short distances, which so many times repeated unexpectedly exceed five miles; and makes that side lose the VVager: then, puts another of a Horse, sold for so much a nail in every shoe, though, beginning at a very low price, but doubling Geometrically till the Buyer come to a dear bargain. A third, of one that invited 12 to dinner, &c. at last he arrives at the grand Question: How many several Com-

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Combinations may be made of the 23 letters, which notwithstanding some restrictions, he reckons up in words at length, (and figures too) to no less a number then seventy thousand two hundred seventy three millions of millions, sixty seven thousand three hundred and thirty millions of millions; three hundred thirty thousand, ninety and eight millions, ninety one thousand one hundred fifty five words: Then in condescendence to his Auditors, he gathers all these words into a Book, just like that in his hand; counts how many pages in a leaf, how many lines in a page, how many letters in a line, then sums up the whole into a world of millions of millions, &c. and all this while, the Title of his Book is, *Of the Center of Gravity.*

But methinks I hear some of you murmur, says he, that you understand this but a little better then the other. To these he offers all imaginable satisfaction, first he surveys the bulk of every single Book, then proposes the gathering them into one Library, whose Model he describes, to say the truth, most exactly: sets down particularly the figure, which must be square, and is call'd *sayes he*, by Mathematicians, Cubical; then appoints the height, no less
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then that of St. Stephen's Tower, of which he gives you the measure to a foot. Then goes to the Walls, how high in themselves, how distant from one another, how many shelves each Wall can hold; how many Books each shelf, &c. then collects the same, not forgetting what space the boards, and other little necessities take up; and still the Title is, Of the Center of Gravity.

It remains, says he, that we consider the breadth: which he contrives to be filled with several rows, each regarding one another, (like our new Exchange) to the very middle, yet providently allowing space for two to walk a breast in a Gallery between the shelves, besides what's requisite for Ladders, to take down the Books; for both which purposes, he judges six foot and a half sufficient: then multiplying and dividing, he learnedly finds out the number of Libraries, capable to contain all these Volumes, to be eight thousand millions; not to speak of the 52 millions, &c. as being but an odd number: I had almost forgot the Cover of the Library, which he cares not, though it be the Concave of the Moon it self.

Still they grudge, and he heares them mutter, that 'twere far easier to apprehend so intricate a mystery, by the quantity of ground these

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these Libraries must be built on, then by their number. To these he professes he would willingly give satisfaction. But what Province, sayes he, what Kingdom, what Empire, of the Chineses, of the Turks, or of the Christians, or rather what World, the Old or the New shall we chu'e for so vast a foundation? To be short, he will try it with the whole Globe of the Earth, let it be (sayes he) as big as it will, and not to lose time in gathering his Libraries into Cities onely, he takes in every inch of dry Land; and setting aside one moyety of the Globe for Waters, he casts up how many feet square the more diligent Moderns reckon are on the surface of the Earth, fifteen hundred millions of millions, &c. then assigns to every Library its due Plant, then sums up what number of them will cover the whole Earth, and at last, concludes they are too few for his work, by more then all our vastest Europe can hold.

If any have yet a curiosity, continues Guldinus to learn whether the said Books, being laid one by another, and close together, can cover the whole Globe, wet and dry, (for he doubts some foul play may be suspected in those large and many Galleries he left for Walks and Ladders, that might have held some millions of Books, and been perhaps sufficient

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Scient without building Libraries on the Sea, which is little better then Castles in the Air.) And here he judges it fit for a Complement of the Problem, that this suspicion be taken away. To the triple reason: therefore he returns as manifold an answer, (I could not easily distinguish this triplicity of reasons; perhaps, if you will bestow so much time, you may at the bottom of the page 356) but to proceed, and end, I hope, ere long, for I am quite tired. Books, says he, may either stand thus on their ends, or on their long edges, or so on their flat sides. The first way, they would overspread above seventeen such Globes as ours: the second, twice as many: the third, above a hundred such Worlds as these, might so be covered with our Books, (he meanes those he there speaks of) that not the least pins point of Earth should be seen.

And were not this enough to tempt any who loves a short and close method of writing, to note with some sharpness such extravagancies? Would you think any farther questions should be rais'd about this business, and that in a Treatise of the Center of Gravity? would you imagin he should ask how many Clarks were necessary, and how much time, to copy these Books? &c. Item (says he)

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be) Whether or no the paper wherein they are written can cover and cloth, not the Earth, but Heaven it self, and the very Firmament, call'd by us the seat of the fixt Stars. He leaves, least he should seem to abuse the patience of their courtesie, to be considered by themselves at their leisure, Thus ends the famous Center of Gravity, and, with these pompous words, closes up it self, *Viam ostendimus qua itur ad astra*: and, if any serious Reader can forgive a Quibble, I think his Motto true and pertinent, since, in my conceit, his Discourse goes quite away from the Center of Gravity, to the utmost bounds or Circumference of Levity.

Perhaps he may retract all this mirth in another place, and I be taken in the same crime with Chrysalpis; but I vow, I am not guilty of knowing any such correction; and, if there prove any, I am sure it must be in some by corner of the Book, else had it been in the open passages, I could not possibly have balk't it.

Besides, I doubt he is a little over-hasty too in his Censures, especially himself being guilty of the fault he charges on others; for having given us, as his own new Invention, (which I easily believe, it being not very excellent)

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cellent) a little Treatise of the Center of Gravity, both of one and more indivisible Points: as also of Lines, he uses a liberty by supposing Points and Lines to have real Gravity, which he flatly denies to Cavalieri, and somewhat roundly censures him calling a Surface, All the lines: and a Solid, All the surfaces; because no multitude of Mathematical lines, can make a surface, &c. And I pray, how many Mathematical points will weigh a pound? why may not Cavalieri as well take up a supposition so advantageous of Mathematicks, and so approv'd by Mathematicians, as Guldinus demand the allowance of One neither beneficial nor admitted; for should we comply with what he desires, as soon as a Point is considered to have Gravity, does it not immediately become of the Nature of a Solid? and then how is the World beholden to him for his new Invention? Should we be froward and deny; how will he possibly prove that to have a Center of Gravity, which has no Gravity?

Nor was it injurious for Chrysalpis to tax Guldinus of unskilfulness in Mathematicks; when, (as 'tis rightly observed in Chrysalpis, Nota quarta) he offended against the very Definition of Inscribing and

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Circumscribing, and either knew not that the Inscrib'd line should with both its ends, touch the Circumscriber; or took two lines to perform the Circumscription instead of one: an error most gross and palpable, when once discover'd; and so indeed are all mistakes in Geometry, though they may deceive some few for a while, as we see by experience, both in Guldinus and Chrysalpis.

Nor is Querela exempt from humanity, he is even a mortal too; and when he takes the Proportion of the Diameter to the Circumference, to be as 7 to 22 he assumes what no Geometrician will allow, unless to Surveyers and Diallers, &c. but absolutely reject in an exact Calculation, which perfect method I suspect was not very easie for him to attain; else surely when he stood upon his honour, he would have us'd his utmost diligence, especially this being his first Essay: for he never did any thing, that I know of, in print, but this Collection of the Errata's of Chrysalpis, and we shall see, even in so easie a task, he needs another to correct him. For he, making his Radius of four places, and not knowing, or not considering the great difference that from thence arises in the Proportion he follows, of 7 to 22 falls often, even himself, who so severely lashes

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labes others, into gross mistakes, as pag. 43.
 line 19. and 25. for $1047619\frac{1}{21}$ he should
 have put $1047197\frac{5}{6}$ that is, greater then
 $1047197\frac{5}{10}$ and less then $1047197\frac{6}{10}$ for
 the Radius being 1000, the semicircumfe-
 rence is $3141592\frac{6}{1000}$ according to Van Cul-
 len's numbers; and therefore the Circle is
 $3141592\frac{6}{7}$ and consequently the Sector
 EBFC $1047197\frac{5}{6}$

P. 43. l. 21. and p. 44. for l. 23. 866. he
 should have said $866\frac{0254}{1000}$ B G. being 500
 R. 3. and consequently p. 43. l. 24. 433000.
 should have been $433012\frac{7}{8}$

P. 44. l. 1. and p. 45. l. 8. and 14. for
 $614619\frac{1}{21}$ the more true is $614184\frac{8}{9}$

P. 44. l. 9. and 22. for $1802\frac{7}{9}$ ought to
 have been $1802\frac{7}{8}$ because A G. is 500
 R. 13.

B 3

P. 44.

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P. 44. l. 11. and p. 45. l. 7. and 14. he puts $197\frac{2}{9}$ where he should have said $197\frac{2}{3}$

P. 44. num. 2. He does not so much mistake, as which is far worse, discover himself a very bungler in the skill he professes; for being to seek out the Angle BAE. he falls a hunting it in the oblique angled Triangle ABE. both the farther way about, and more intricate to find; whereas there lay plain before his eyes a right angled Triangle BAG. with all the sides known in such numbers, that a bare inspection into the Canon gives the Angles; for half the number (which method I take as more conformable to the Tables) put for BG, considering onely the first four places in the Canon of Sines, gives the Angle BAG: and half the number put for GA, gives the Angle GBA. whose Complement is BAG.

Pag. 44. l. 17. 30° should have been left out, see, Brigs's Canons.

P. 44. l. 20. and p. 45. l. 1. 1791126. ought to have been $1791289\frac{5}{6}$

P. 44. l. 24. $1561205\frac{5}{9}$ ought to have been $1561249\frac{4}{5}$

P. 45.

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P. 45. l. 3. 9. 16. $230920\frac{1}{9}$ ought to have been $230040\frac{0}{1}$

P. 45. l. 18. $242433\frac{1}{3}$ ought to have been $242264\frac{4}{5}$

P. 45. l. 19. $11512\frac{8}{9}$ ought to have been $12224\frac{3}{4}$

In these mistakes, Querela either Copy'd the Tables of others; and then, why did he not chuse the more exact? or calculated all himself; and then, why did he not do it more exactly.

Perhaps he may say, his numbers are favourable to Chrysalpis, then the true ones: And it deserved acknowledgement, had it proceeded from kindness: but he shews the unexpectedness in this case, of such a charity; who ever was known to hide their civilities so darkly, that one must seek the exactest Tables of Sines, and use so many figures to find them out? No, were Querela a perfect Adversary of Geometry, he had not been necessitated to so inferior and unsevere a Method; where, what never as yet was done, nor perhaps ever will be done, (the Quadrature of the Circle, and the precise exactness of

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the Canon of Sines :) is, in rigorous Geometry, unallowably suppos'd; both which inconveniences were clearly avoided by that Learned and Noble Hand that with evident and unexceptionable Arguments convinc't Chrysalpis, such as enforce the assent, Without begging the Courtesie of a supposition.

But Querela may possibly answer, The error was so plain, that there needed no more then the Doctrin of Triangles to confute it: I reply, how would Querela else have confuted it, the top of whose skill seems to reach no higher? nor indeed so high, with any just exactness, as his many mistakes have sufficiently discover'd.

And let him not complain of the easiness of his task; he quickly may find in Chrysalpis's other Writings an employment worth his undertaking: Let him not cowardly triumph over One that had already yielded to a Noble Conquerour, and crost the Cudgels before Querela took 'em up; but manly begin with him on some worthy subject, fresh and unsoil'd by any other, and follow him close and roundly, and if he be but rigorously just, with as little mercy as he pleases; onely he is intreated not to harp perpetually on some one string that haply may displease him, but strike it a while, that it may be heard, then
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put it in tune, and go on to another; for I have often observ'd among the Dislikers of that eminent Author, the Parable of the hundred Sheep perversly verisified, they leave the ninety nine just Opinions carelessly in the Wilderness; and all their zeal is busie about the One that went astray; which when they have found, they lay on their shoulders, that all the World may see they have catch't him; and calling their Friends and Neighbours together, invite them to congratulate their happy fortune, that they have found, in a whole flock, one faulty sheep: whereas, were this excellent similitude duly understood and apply'd, we rather should endeavour to rectifie any single or rarely repeated error of another; and rejoyce, not that it was committed, but that it is amended.

And here, to acquaint my Reader with the whole design I aim at by this invitation; I protest, it rises not from any the least humour of provoking or making debates; but a hopeful desire, by such Discussions, more evidently to see, and more heartily embrace those solid truths, whom ever they belong to, that shall stand so severe a tryal: declaring openly before hand, this politick resolution, unblameable I hope in such engagements, to
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put my self still on the stronger side, and so be sure who ever overcomes, to have my share in the Victory.

Besides, a curious eye may note in Querela, some touches also of dissimulativity, as p. 4. where he discourses, as if Chrysalpis should pretend he had never study'd Geometry: and p. 5. that he had not read so much as Euclide: and other little sleights of hand to help his Game: whereas the truth is, Chrysalpis says he never read over (or rather thoroughly) so much as Euclide; nor ever profess to study Geometry; though in that very place he directly affirms, he had both study'd it for recreation, and attain'd sufficient skill in it, to transfer its rigorous proceedings to Metaphysicks. All which Querela's Publisher honestly acknowledges in his Translation of the Latin, p. 58. and I am glad my Name-sake is the fairer Gamester.

Nor will I here omit a Passage, wherein, I confess, I have not art enough entirely to justify either of them. Chrysalpis writes mistakably; and Querela mistakes him: the One might have express'd himself more plainly; the Other might have interpreted him more courteously: Both in some sense perhaps defensible; and in some sense both blameable. Chrysalpis says, Guldinus was so
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vain, that when he thought he had committed an error, he could by no means be induced to cover it, by blotting it out; And so far is true, for he publishes it: or, candidly confesses the same; Yet, all's well enough; for whoever reads Guldinus shall see, how long he rolls the sweet morsel in his mouth, before he can be persuaded to spit it out: but goes on framing excuses, as if in the very error he had carried himself gallantly; And, does not he frame excuses, who after a plain Demonstration of his error (and that, found out, as he says, by himself) puts down in the very next number, a Notandum that what he held was probabilissimum; and then proceeds to examine on both sides (as if the point were yet doubtful) which reasons are the stronger, and if any fail, how it comes to pass, and which are they, &c.

After these Advertisements, he immediately advances this Proposition (of which already I have given some touch) *Detegere quomodo Principium &c. assumptum subsistat*; not how it miscarries: for still he holds the Maxim, that deceiv'd him, true, though not universally; *verum est, sed non universim*; which words must be meant in that sense wherein himself misunderstood the

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the notion of Inscrib'd and Circumscrib'd; else as all the rest of the World interprets them, that Maxim is absolutely and universally true. And, as to imagin what he call'd Inscrib'd to be less then the Circumscriber, was a pretty Conjecture, and might not want hope to deceive, were it in some other Science then slow-believing Mathematicks; so, to take those lines to be inscrib'd, which had but one common term, was an intolerable Oversight.

Now for the hardest task; that he bore himself as if he had done gallantly, thus much, even of that, he verifies: not onely speaking of his opinion as most probable, when he knew it to be false: nor onely mincing the business, while he says, his Principle is true, though not universally: but, maintaining that the ground of what he affirmed was, to use his own odd expression, Commune quasi in Geometricis assertum generale: and so plausible still, and dear to the good man was his own invention, that, at last, he sends his Reader once more to review the Demonstration that sustains his so probable Opinion; and then thus asks his judgement, annon ea intellectum ipsius quodammodo ad assensum, si non omnino cogat, saltem suaviter pertrahat?

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This is the Crime that amaz'd Querela ; this the foul and evident untruth against which he exclaims as a most unworthy and false Calumny, and maliciously imputed to Guldinus. Words of too fierce and rude a sense, for so mild a nature as Querela seems to have, whose choller sometimes may smother a little, but surely never boyl over, unless some hotter spirits blow the Coals; though perhaps once put into a heat, we know not when he may cease; but, let him carry on the metaphor a line or two farther, and it will faithfully give him this seasonable advice, that intemperate overflowings, both spill themselves, and diminish the fire that rais'd 'em.

And sure he was a little warmer then ordinary, else what mean those angry and rash, and (which I am loath to say) untrue expressions, pag. 30. Of all that Chrysaëpis so maliciously here imputes to Guldin, there is not one word to be seen in him, nor the least ground or shadow in his writings; yea, just the contrary to what is here so shamefully avouch't, &c. and p. 33. No man that has any worth in him, conscience, or morall honesty, would ever so unworthily have carried himself: And why so furious good Querela, against your Ad-

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Adversary? why so passionate for your friend? I'm sure you had not read over his whole Book when you wrote these undertaking words, not the least shadow in his writings. You affirm, he says, just the contrary, and 'tis acknowledg'd, for he says almost just the contrary to himself; besides, I must tell you (what already is sufficiently prov'd) there is more then one word to be seen, more then the least ground or shadow to justify Chrysalpis his charge against Guldinus, of Vanity, unskilfulness, &c. for I find no pleasure in repeating anothers faults, if it were not necessary to the clearing of my Friend, and, I hope, should Querela seek any exception against my proceeding, he wil find my answer in his own.

Again, why so furious at this time, Querela, and upon this occasion? while your Antagonist oppos'd onely Tenets which you commonly call'd Articles of faith, you very neighborly let him alone: while he did but evacuate all Christian Religion, and introduce a Pagan Philosophy, as others accuse him, you patiently held your hands: but when he once presum'd to go too far, and touch one of your friends, then immediately you strike him on the face with

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with malicious, shameful, nonsense, &c. then flies out Querela (true to his name) full of complaints and accusations, and bitter resentments.

And now, tell me for love of truth, how comes it to be lawful for the Opposers of Chrysalis, to talk, and write, and act what they list against him; and be not permitted (who neither talks much, nor acts any thing against them,) to write a little in defence of himself? Remember how insolently his Vindicator provokes him, with Pagan Futility, Epicurean Philosophy, Miscreant, Imp of Hell, &c. Remember how bitterly Querela reviles him, with false Calumniation, notorious Detraction, a man of no worth, no conscience, not moral honesty, &c. Remember how spitefully the ignorant followers of these principal Parties asperse him, abridging all the anger their Tutors teach 'em, into this compendious calumny, HERETICK. And when they have done all this, and more, and every day, and every where, immediately their rash and forward passion will censure him, if he sit not down in a dull stupid indifferency, but shew himself sometimes a little sensible of their unreasonableness, in his Replies; which yet he does both very seldom, and onely by occasional

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sional touches where the subject invites him; not in downright railings and long invectives, wherein his envious Adversaries too often exercise both their lungs and spleen against him.

But enough of this captious kind of contending, and too much indeed for an ingenuous mind, were it not unhappily countenanc'd by the common practise of all the Tribunals in the World, even spiritual as well as temporal; nay, in the inward Court of Conscience too, where the modern Casuists are allowed for Judges.

But, can we derive no profit from these miscarriages? sure if we had the art, we might extract good out of greater evils than the worst of these: And methinks I discern already, some advantages which perhaps may repair what the misadventures have lost.

Chrysalpis, by retracting this Demonstration, has given us another, in a far more concerning affair; That when e're he shall be convinc'd of any error in his other works, he is ready ingeniously to disown it.

Querela, by discovering this mistake, may receive encouragement to search for more; an endeavour which as I hope would be very beneficial to the World; so I am sure, very
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Welcom to Chrysalpis: especially from Querela, whom, I have reason to say, (for his own hand has told me it) he really esteems as a Person, in himself, of a good nature, and unpassionate temper. And if I may be permitted to interpose my conceit, I shall not doubt to affirm that both of them may more improve the World by confining hereafter their studies to their proper Professions; and do better right to themselves, by agreeing, for what's past, to forbear one another.

The friends of Chrysalpis, too often injuriously charg'd as blind Adherers to his Doctrine, may fairly take hold on this occasion; and with one short question, silence all their Censurers. Which of us believe his Quadrature? Confute but his other Opinions as we confess this may be done, and you soon shall see how few will follow him; And yet, (now I remember a letter, he did me the honour to send me in reference to this very business) we still shall follow him; for there he candidly professes in these express words, None of my friends need provide against following me in an error, for soon as 'tis discover'd, my self shall be the first to go before them in forsaking it.

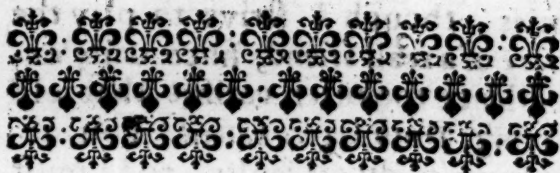
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For Conclusion, I have onely this short wish to propose, That hereafter Chrysalpis may be Warier in preventing the objections of his Adversaries; and Querela temperater in exalting the merits of his Friends; and both more severe in their Mathematicks, and less in their Censures. Which mildnes too, I humbly intreat of the ingenious Reader, to pardon my detaining him so long with superficial discourses, from passing on to the following more solid reasons: and accept for my excuse, this free acknowledgement; The shallow Water covers most ground, but the deep contains most substance.

ERRATA.

Pag. 4, l. 17. Circle-squarers. P. 11. l. 35. though *dele.* P. 12. l. 6. millions of millions of millions. P. 16. l. 5. Stars, he leaves, *ib.* l. 11. if my serious, P. 21. l. 2. $\frac{0}{1}$ not $\frac{0}{1}$
ib. l. 4. $\frac{4}{5}$ not $\frac{4}{5}$ *ib.* l. 6. $\frac{3}{4}$ not $\frac{3}{4}$

A



A
LETTER
TO THE
AUTHOUR
OF
Querela Geometrica.

SIR,

IF you have read *Pintarch's Book*,
Of the profit to be deriv'd from E-
nemies, I hope this Letter may
finde a convenient Lodging in your
breſt; for, I doubt not, you may
like'y eſteem me one of your ene-
mies,

A Letter to the Author

mies, though I strive to play the part of a reall friend, since daily experience too often verifies that old saying, *Truth begets hatred*. You accuse me of divers faults, and I must seek to acquit my self. As for my errors in *Geometry*, I weigh not much whether they be great or little; but for your moral complaints, I desire to give satisfaction to rational persons, and first to your self, if you be so disposed.

In your Frontispiece, you charge me with injuries done to *Geometry*, but in your Book, you mention onely wrongs against one *Geometrician*. Who then is this *GEOMETRY*? True it is, the *Geometrician* is one of the Society, and peradventure, you may be also one or more of the same Company, And I am not ignorant it is an use among them, to call themselves *THE CHURCH*, and to say what ever is written against them, is written against *THE CATHO-*
THO-

of *Quærela Geometrica.*

THOLICK CHURCH; but this is the first time, I ever heard them style themselves **GEOMETRY**, and aver what is written against *one* of them, is written against **GEOMETRY**.

After your title, you go to my intention in setting out *Chrysaſpis*, and tax me for thinking it proceeded from God. I confess I did not expect such a censure from you, that I should be blamed for giving the honour to God, of a work which I apprehended far above my worth and force, especially acknowledging my self so weak a Mathematician, as you often profess I give my self out for. Think how many thousand years the Quadrature of the Circle hath been an invincible Probleme in *Geometry*; can you your self then doubt but if I had done it, it were by a speciall providence of God? for, not onely rigorous

A Letter to the Authour

Miracles, but every remarkable Conjunction of natural Causes singularly influential towards some good effect, may fitly be cal'd *Gods special Providence*; or, ought I be blamed, if, having the opinion that it was perform'd, I should attribute it to God? Had you condemn'd me of *rashness*, for *thinking* I had done it, your Objection might have seem'd reasonable, and no other defence had remain'd for me then to say, I was not the first, nor the best Mathematician who had fallen into the same error.

Farther you urge, my adversaries have a great advantage against my other Doctrins, For they have no more to do to convince them all, then to shew my Quadrature is false, which is the warrant to all the rest. Give me leave, Sir, to tell you, you speak like a stranger to the true notion of Science. Science
stands

of Querela Geometrica.

stands on its own leggs, and is secure or failing out of its intrinsecal foundations. The help it receives from extrinsecal authority, is onely in regard of the ignorant, who are not capable of Science in it self: so that to make advantage of *Geometrical* failings, must either be towards ignorant Persons, or from them; such as it seems you would frame adversaries to my Doctrin: for such, all they who take these kind of advantages, must profess themselves to be. Sure, I may as well argue, that you approve all my other Writings, because you except onely against this; as you conclude, I mistook in this, therefore I am wrong in all the rest; especially, since, could you catch me notably tripping in any of them, you would not fail to give me a fall.

After this, you come to the Quadrature it self; wherein your chief annotation is, that I perform no

A Letter to the Author.

more then an hypothetical or conditional Quadrature, that is, if such or such a proportion were known, it were possible to square a Circle. I answer, my endeavour was to find out absolutely, not conditionally, the proportion you talk of, and had it been fortunate, had perform'd it, as all Mathematicians who have declar'd themselves about my way, agree; and, if you please, you may understand from the Noble Lord *Brouncker*, who with a favour and civility towards me, matchless by any thing but his own Learning and excellent endowments, demonstrated the proportion I aym'd at to be a plain mistake; yet, that if my fifth proposition had held, the thing had been done. His Lordship having thus fully convinc'd me, and thus highly oblig'd me, I return'd him my humblest acknowledgements; and immediately directed the suppression

of Querela Geometrica.

pression of the Copies, as your self confess you found them: after which, for you to come with a clamorous and printed confutation, was extremely both unhandsome, and uncharitable; and lookt upon as such by the civillest Wits of our Nation.

You say my Treatise contains 13 Propositions, wherein I wonder you could mistake. Not onely the matter being diverse in three of the four last, and plainly appertaining to a former work, called *Exercitatio Geometrica*, but the very print and paper being divers, and *Finis* set at the end of the ninth Proposition; so that it is evident, *Chrysaspis* was finisht in nine Propositions, to which most of your reasons are out of a mistake, or not understanding the work; and indeed, I have from better Mathematicians then my self, that you understand not well your
own

A Letter to the Author

own; so many and notable errors they observe in one or two leaves of your Anger against me.

Now as to the Appendix, first you say, *Guldin* (or *Gulden*, 'tis all one to me) invented the demonstration I repeat out of my *Exercitatio*. Whether you speak by hear-say, or by the chance of cross and pyle, I know not, but whoever reads the two Demonstrations, will find them as different as can be; and yet you tell your Reader, I acknowledge them to be the same.

You add, I put a second Demonstration, and that you say is mine own; and the second, I confess, hath some likeness with *Guldins*; for it argues the same way, though it proceed by streight lines, and *Guldins* by ciroular ones.

There follows in your work, your Geometrical Examination of my errors; In which I intend, neither
to

of *Querela Geometrica*,

to justifie what I have written, nor reprehend what you have, not taking it to be worth my pains, till I am assured whether my Demonstration of the Quadrature, will reach to some other proportion, since the chief end for which I made it, is miscarried. For I sought not commendation to my self out of *Geometry*, but an attestation to my other Writings; which once disappointed, the rest I have written is not worth my pains to rectifie.

As for my bitterness against *Gul-
din*, it is not against his Person, who as you say never offended me, neither did I ever know him, but against a base abuse done to *Geometry*, to mingle with its purity, the scurf of probability, and so to bring it into the scorn of being held no better then Logical discourses. This he having attempted, by putting
into

A Letter to the Author

into his Geometrical Book, fantastical Propositions; and colouring his supposed error, by Arguments not favouring of *Geometry*, made me say he knew not the *duty of a Geometrician*; and, though he might have many Geometrical things in him, was not therefore a Mathematician, as not having the judgment to discern betwixt the use of probable Reasons, and demonstrative ones; but thought the Arguments which himself took to be but probable, might lawfully be entertain'd in *Geometry*.

This is the imputation I lay'd to his charge, and prov'd by those Instances you cite, and confess to be his. Yet you are displeased with me: and to make your displeasure seem reasonable to the Reader, you impose upon me that I say he holds those errors since he recalled them, which I neither do,
nor

of Querela Geometrica.

nor concerns it me to do. Now whether it ought to be interpreted *gall*, when a man layes a Charge and his Proof down, let the discreet and experienc't judge. Ignorance it may be in him that does the wrong; not passion, if his charge be no greater then his evidence maintains.

You say farther, that I tax him with morall vices ; and I cannot deny, I thought he had a vanity in excusing himself, nor do his words express any less; but for any great viciousness, I am far from either saying or thinking it of him. And, if his proceedings made me conceive he was one of that kind of men, who draw all things to incertainty, I do not therefore infer, he doth so in matters of Faith, on which he toucheth not as far as I have understood ; nor can any such sence be fairly deduc'd out, of my words, since every one of that kind of men doth it in his own sphere,

sphere, not in all matters. Much less do I tax him of Heresie, whereof I accuse not the Persons, even of them, whose sentences, I doubt not, are Heresies. True it is, the endeavours of those whoever they are, that seek to destroy all certainty, I perfectly hate, and use what means I can to shew their perniciousness.

And with this I think, I have answer'd your moral oppositions. There is indeed a Geometrical one against the thirteenth Proposition, of which I make no mention, because it is the same with the sixth, wherein, I have before affirmed that my Lord *Brouncker* had convinced me; and so I have nothing to reply. Onely I hope my yielding to my Lord, will be a pledge to you, that I shall be willing to do the like in my errors in other Sciences, as you charitably pray for me: in which prayer I hartily joyn, adding
this

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this farther, that I may find out men who will endeavour to shew me my errors ; for I doubt not , but there are divers, and I hope I am willing to know them : onely I require proper proofs, fit for the understanding, not extrinsical motives of the will, to make it prevent prudence.

To come to an end, if you can have so just an opinion of me, that it is want of understanding, and not malice, that hath been the cause of any errors of which I have not given satisfaction, I shall be glad for both our sakes. If not, I will seek to imitate him to whom it was said to his face, *Doemonium habes*; and not fail on my side, though unknown, to be

*Your real well-wisher, and
faithful Servant,*

THO. WHITE.